8-2: Limits of Sequences

Warm-up: Estimate the millionth term of each sequence to the nearest integer, if possible.

1. The sequence defined by $a_n = \dfrac{3n-2}{n+1}$ for all positive integers n.

2. The sequence defined by $\begin{cases} b_1 = 400 \\ b_n = .9b_{n-1}, \text{ for int } n \geq 2 \end{cases}$.

3. The sequence defined by $\begin{cases} b_1 = 6 \\ b_n = \frac{3}{2}b_{n-1}, \text{ for int } n \geq 2 \end{cases}$.

Limit of a Sequence:

End Behavior:

Divergent:

Convergent:

Harmonic Sequence:

Alternating Harmonic Sequence:

Limit Properties

(1)

(2)

(3)

(4)

(5)

(6)

(7)

Example 1: Is the sequence defined by $s_n = \dfrac{n^2}{2n+100}$ convergent or divergent? If it converges, find its limit.

Example 2: Find $\lim\limits_{n\to\infty} \dfrac{(-1)^n}{n^2}$.

Example 3: Find $\lim\limits_{n\to\infty} \dfrac{6n+4}{5-3n}$.

Homework:

"In three words I can sum up everything I've learned about life: it goes on." – Robert Frost